

REMARKS

Claims 1, 3-15, and 24-27 remain pending in the application. By this paper, Claims 1 and 25 have been amended and Claim 27 has been added. The basis for these amendments and this new claim can be found throughout the specification, claims, and drawings originally filed. No new matter has been added. The preceding amendments and the following remarks are believed to be fully responsive to the outstanding Office Action and are believed to place the application in condition for allowance.

The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 103

Claims 1, 3, and 24-26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 08313890 (Hidenori et al) in view of JP 10-062604 (Hideo), U.S. Patent No. 5,220, 444 (Mitsui et al.) and U.S. Patent No. 5,850,276 (Ochi et al).

Claims 4 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 08313890 (Hidenori et al) in view of JP 10-062604 (Hideo), U.S. Patent No. 5,220, 444 (Mitsui et al.) and U.S. Patent No. 5,850,276 (Ochi et al), as applied to claims 1, 3 and 24-26 above, and further in view of U.S. Patent No. 6,315,801 (Miyazaki et al.)

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 08313890 (Hidenori et al) in view of JP 10-062604 (Hideo), U.S. Patent No. 5,220, 444

(Mitsui et al.) and U.S. Patent No. 5,850,276 (Ochi et al) as applied to claims 1,3 and 24-26 above, and further in view of U.S. Patent No. 5,973,763 (Fujimura et al.)

Claims 7-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 08313890 (Hidenori et al) in view of JP 10-062604 (Hideo), U.S. Patent No. 5,220,444 (Mitsui et al.) and U.S. Patent No. 5,850,276 (Ochi et al) as applied to claims 1,3 and 24-26 above, and further in view of U.S. Patent No. 6,130,736 (Sasaki et al.).

These rejections are respectfully traversed.

Independent Claim 1 calls for a substrate for a liquid crystal device including a planar region and a roughened region comprising microscopic peaks and valleys. See Specification at pg. 19, Ins. 11-25. In addition, independent Claim 1 calls for “a predetermined mark made of a metal film” formed on the planar region, and “a reflecting film made of the same metal film” formed on both the microscopic peaks and valleys. See Specification at pg. 21, Ins. 6-21, and FIG. 1F. The predetermined mark is “separated from the reflecting film,” wherein a surface of the reflecting film is affected by a surface comprising the microscopic peaks and valleys of the roughened region for yielding predetermined scattering characteristics on a reflective display. See Specification at pg. 31, Ins. 23-25, pg. 32, Ins. 1-4, and FIG. 1F.

Independent Claim 25 calls for a substrate for a liquid crystal device including a surface having a planar region and a roughened region, wherein the roughened region includes microscopic peaks and valleys and the tops of the peaks in the roughened region having heights substantially equal to, or less than, a plane of the planar region. See Specification at pg. 19, Ins. 11-25. A predetermined mark made of a metal film is formed on the planar region and a reflecting film made of the same metal film as the

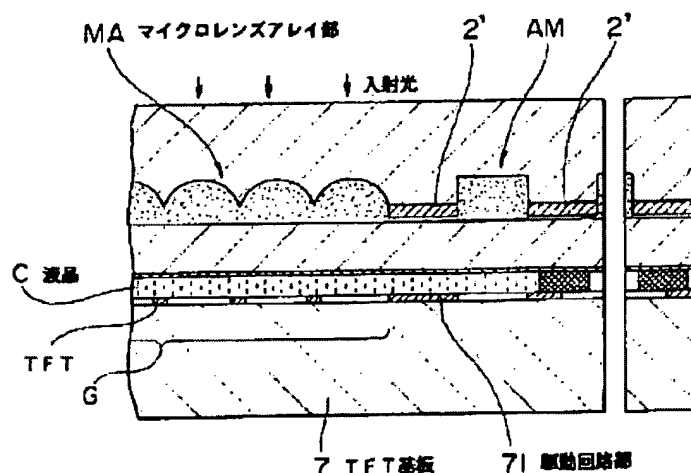
predetermined mark is formed on the roughened region, whereby the predetermined mark is separated from the reflecting film. See Specification at pg. 21, Ins. 6-21, and FIG. 1F. A surface of the reflecting film is affected by a surface comprising the microscopic peaks and valleys of the roughened region for yielding predetermined scattering characteristics on a reflective display. See Specification at pg. 31, Ins. 23-25 and pg. 32, Ins. 1-4.

In this manner, a liquid crystal device is provided incorporating a substrate having a roughened region and a planar region. See Specification at pg. 19, Ins. 11-13. In addition, a metal film is disposed on display areas of the liquid crystal device (planar and roughened regions). See Specification at pg. 21, Ins. 6-9. The metal layer acts as a reflecting film on the roughened region and is patterned on the planar region to form an alignment mark that is separated from the reflecting film. See Specification at pg. 21, Ins. 9-11, pg. 21, Ins. 15-17, and FIGS. 1E-1F. The reflecting film disposed in the roughened region improves scattering characteristics of the liquid crystal device. See Specification at pg. 31, Ins. 23-25 and pg. 32, Ins. 1-4.

Hidenori, Hideo, Mitsui, and Ochi fail to teach such a relationship, either in combination or alone. The Examiner admits that Hidenori and Hideo fail to teach a predetermined mark made of metal film and a reflecting film made of the same metal film as the predetermined mark. See Office Action mailed April 5, 2005 at pg. 3. However, the Examiner asserts that Hideo teaches photoresists (2') that become an alignment mark area and that the photoresists are formed on a planar region. See Office Action mailed April 5, 2005 at pg. 3. Applicants respectfully submit that Hideo fails to teach such a relationship.

Hideo teaches using an etching mask (2) for creating a series of *transparent* micro lenses (R). See Hideo at FIGS. 2(a-b). The etching mask is not used as the alignment mark. The designation “AM” denotes the alignment mark. See Hideo at FIGS. 3, 2(a), and 5(a). The alignment mark is received generally between portions of the etching mask and within a micro lens. See FIG. 3 reproduced below in relevant part.

【図3】



In this manner, the alignment mark is not formed on the same substrate having the photoresist. The alignment mark of Hideo is formed on another substrate *opposite* the photoresist. Therefore, Hideo fails to teach a photoresist that that functions as an alignment mark as asserted by the Examiner.

Applicants also note that Hideo teaches use of a transparent substrate having a plurality of micro lenses. The present invention is directed toward forming a reflective metal layer over a roughened region to improve light scattering. The so-called “roughened” region of Hideo is not designed to scatter light, but rather, is a series of transparent micro lenses designed to receive light theregthrough. Therefore, Hideo

teaches away from forming a metal reflective layer over a roughened region to improve light scattering.

The Examiner asserts that Mitsui discloses a substrate (11) having a planar region and a roughened region with a metal layer such as silver covering both the planar region and the roughened region. See Office Action mailed April 5, 2005 at pgs. 3-4.

Applicants respectfully submit that while Mitsui teaches that it is “essential to control the surface roughness of the reflection plate” that Mitsui fails to teach or suggest using a metal film in a roughened region to improve scattering characteristics and using the same metal film in a planar region for use as an alignment mark. Applicants respectfully submit that while Mitsui teaches forming a metal film over a roughened region and a planar region, Mitsui does not teach or suggest separating the metal film such that the remaining metal on the planar region is used as an alignment mark and the metal film in the roughened region is used to improve scattering characteristics.

Ochi discloses that “the first alignment mark 26 is formed in the same process as the production process for the drive substrate 21 when forming the metal layer 27 of aluminum (Al) or titanium (Ti) for the wiring material.” See Ochi at Col. 6, lns. 23-27. In other words, Ochi only includes a flat portion in the substrate and does not have either a roughened region or a reflective type display. The combination of Mitsui and Ochi does not therefore yield a teaching or suggestion to form a metal layer on a roughened region **and** an alignment mark on a planar region, wherein the metal layer on the roughened region and the alignment mark on the planar region are formed from the same material. This crucial nexus is missing.

Mitsui teaches forming a continuous metal layer over a roughened region and a planar region. Ochi teaches forming a drive substrate and an alignment mark from the same process as used in the production of the drive substrate. There is no teaching or suggestion to form a metal film over a roughened region to improve scattering characteristics **and** to form the same metal film on a planar region for use in properly aligning individual substrates. Applicants further note that the so-called “drive substrate” of Ochi is not used as a reflective-type display. Therefore there is no teaching or motivation to provide the drive substrate with a roughened region to improve scattering characteristics.

Because Mitsui and Ochi fail to teach or suggest forming a metal layer on a roughened region to improve scattering characteristics **and** forming a predetermined alignment mark on a planar region from the same metal film, and none of the cited references cures this deficiency on Mitsui and Ochi, Applicants’ invention is not taught or suggested by the prior art and reconsideration and withdrawal of the rejection is respectfully requested.

In this manner, it is believed that independent Claims 1 and 25, as well as Claims 3-15, 24, and 26, respectively dependent therefrom, are in a condition for allowance in light of the art of record. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection.

NEW CLAIM

Applicants have added new Claim 27. New Claim 27 is believed to be in condition for allowance in light of the foregoing remarks.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: July 5, 2005

By: G. Gregory Schivley

G. Gregory Schivley

Reg. No. 27,382

Bryant E. Wade

Reg. No. 40,344

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

GGs/BEW/MHS/pal